Shima et al. (US 5,949,934) in view of Kohnke et al. (US 6,221,566 B1), while claim 4 was rejected over these two reference and in further in view of Chen et al. (US 6,356,681). The applicant respectfully traverses this rejection and argues that the current invention, as recited in the amended claims 1-4, is neither anticipated nor made obvious by these references. The applicant would like to point out the following distinctions.

The present manufacturing method, as recited in the amended claims, comprises hydrogen loading processing into the material optical fiber, forming processing of the grating part in the optical fiber by irradiation of the ultraviolet light at a predetermined period, uniform UV irradiation and uniform heat trimming processing of the grating part as a whole in order to adjust the optical properties of the grating part, and a final annealing processing for stabilizing the optical properties of the grating part. More specifically, the features of the present applications in manufacturing the optical fiber grating are as follows:

1) hydrogen loading before forming the optical fiber grating,

2) forming processing of the grating part in the material optical fiber by irradiation of the ultraviolet light in the wavelength near 240 nm using an excimer laser,

3) dehydrogenation processing after the grating part has been formed, and

4) optical property adjusting processing for adjusting the optical properties of the grating part by combining uniform ultraviolet irradiation and uniform heat

trimming processing at an optional numbers of times in order to adjust the optical properties of the optical fiber grating part;

5) final annealing processing by uniform heating of the grating part for stabilizing the optical properties of the grating part, and

6) the optical property adjusting processing by combining the uniform ultraviolet irradiation and the uniform heat trimming is carried out while monitoring the optical properties of the grating part by monitoring the transmitted light, the reflected light and the reference light of the optical fiber.

Shima et al. (U.S. Patent No. 5,949,934) discloses forming a grating part in an optical fiber, which consists of a core made of a silica glass with an impurity dopant and a cladding made of silica glass. However, Shima et al. does not disclose or teach the hydrogen loading processing, the optical property adjusting processing by combining the uniform ultraviolet irradiation and the uniform heat trimming at optional times for adjusting the optical properties (the center wavelength, the rejection rate, and the rejection wavelength bandwidth), or the final annealing processing for stabilizing the optical properties of the grating parts. The Examiner admitted in the Office Action (para. 2) that this prior art reference does not disclose the optical property adjusting processing.

While Kohnke et al. (U.S. Patent No. 6,221,566) appears to contain some teachings regarding increasing the base refractive index of the grating part by uniform

irradiation of the ultraviolet light, to form the grating part in an optical fiber by periodic irradiation of the ultraviolet light, to load hydrogen or deuterium to the optical fiber when adjusting the optical properties of the grating part in order to sensitize the optical fiber for the refractive index variation by the ultraviolet irradiation, and to unload hydrogen or deuterium after adjusting the optical properties, it does not disclose at least one important feature of the present invention, namely element 6 above: optical property adjusting processing for adjusting the optical properties of the grating part by combining uniform ultraviolet irradiation and uniform heat trimming processing at an optional numbers of times in order to adjust the optical properties such as the central wavelength, the rejection rate and the rejection wavelength band width.

Chen et al. (U.S. Patent No.6,356,681) contains some teaching regarding adjusting the optical properties of the grating part by adjusting the length of the grating part by external heating the neighborhood of the grating part. In addition, when adjusting the optical properties of the grating part, a spectral analyzer is disposed at the output side of the optical fiber for monitoring the optical properties of the optical fiber. In practice, the optical fiber is fixed on a fixing board while being tensioned, and the neighborhood of the grating part is first fused by heating with a CO_2 laser and subsequently annealed, to thereby increase the length of the optical fiber for adjusting the central wavelength at, for example, 1559.2 nm. When the optical fiber is externally heated by the CO_2 laser, the

output light from the fiber grating is monitored by the spectral analyzer to adjust the central wavelength.

The adjustment of the optical properties suggested by Chen et al. significantly differs from that of the present invention, as recited in the amended claims. Chen et al. adjust the optical properties of the grating part by changing the length of the optical fiber including the grating part by externally heating and fusing and then annealing the tensioned optical fiber. Therefore, the adjustment suggested by Chen et al. differs significantly from that of the present invention, in which a combination of uniform ultraviolet irradiation and uniform heat trimming is carried out to achieve the optical property adjusting processing

In para. 3 of the Office Action, the Examiner pointed out that Chen et al. discloses the subject matter of claim 4 of the present invention in that the uniform ultraviolet irradiation processing and said uniform heat trimming processing are optionally carried out while monitoring the transmitted light, and/or the reflected light of the optical fiber grating and the reference light. The subject matter of the present claim 4, however, is to monitor the transmitted light, the reflected light, and the reference light of the grating part. This subject matter is not disclosed or suggested by Chen et al., in which only the light transmitted through the optical fiber is monitored.

In view of the foregoing, the applicant submits that the present invention, as recited in the amended claims, is neither anticipated nor rendered obvious by the cited prior art references. Entry of this amendment and an early favorable action on the merits are respectfully requested.

Respectfully submitted,

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DATE: August 29, 2003

NAME: Daniel Basov

SIGNATURE: D. Basov

Version With Markings To Show Changes Made

-- 1. (Twice Amended) A manufacturing method for an optical fiber grating comprising the steps of:

loading hydrogen in a material optical fiber for forming the optical fiber grating in order to increasing the photosensitivity of the optical fiber when necessary;

forming a grating part having a periodic refractive index distribution by irradiating an optical fiber along the longitudinal direction with ultraviolet light at a predetermined period and carrying out dehydrogenation when necessary;

carrying out at least once uniform ultraviolet irradiation processing that irradiates the grating part as a whole [at a predetermined temperature and time] with ultraviolet light;

carrying out at least once heat trimming processing that uniformly heats the grating part as a whole at a predetermined temperature and time; and

carrying out [heat aging] final annealing processing that heats the grating part to a uniform temperature for a predetermined period in order to stabilize the optical properties of the grating part.